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NOTES ON THE FLORA OF TAIWAN (20)-- *SCUTELLARIA* (LAMIACEAE) IN TAIWAN[1]

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ABSTRACT: A brief revision of the species of *Scutellaria* (Lamiaceae) in Taiwan has been made. Five species are accepted in this paper. Three corolla types including the robust type, geniculate type, and curved type can be distinguished. Four types of nutlet coat ornament-ation including grape-hook type, radiated umbrella-like type, rounded concentric type, and mammillate type are observed. SEM micro-graphs of pollen grains and nutlets, chromosome numbers, key to the species, species illustrations, distribution maps, and other relevant informations, are provided.

KEYWORDS: ***Scutellaria*, Lamiaceae, revision, Taiwan.**

INTRODUCTION

Scutellaria, with 425 species (Paton 1990), is a large genus of the Lamiaceae. It was first reported by A. Henry (1896) in Taiwan. Since then, several papers on *Scutellaria* of Taiwan have been published by Matsumura and Hayata (1906), Hayata (1911, 1919), Kudo (1929), Yamamoto (1934), Ohwi (1934, 1935), Sasaki (1936), Yamazaki (1969, 1992), Li (1977), Huang and Cheng (1978), and Ying (1991).

Although many papers were published, some questions are still unanswered. The specimen of *Henry 2073* (identified as *Scutellaria indica* L.) collected from S. Cape (Southern Taiwan) is dubious, because no specimen of *S. indica* from Southern Taiwan has been found since Henry. *Scutellaria taiwanensis* C. Y. Wu was reported by C. Y. Wu in 1977 according to the specimen *Kudo et Mori s. n.* 1931 from Taiwan, but it is not documented. *Scutellaria tarokoensis* Yamazaki was distinguished from *S. tashiroi* Hayata by Yamazaki in 1992. The former has upcurved short pubescence on stem and small leaves (0.5-2 x 0.4-1.5 cm), and the latter has retrorsely short pubescence on stem and large leaves (2-3.5 x 1.5-2.5 cm). Based on the specimens in TAI , the leaves of *S. tashiroi* and *S. tarokoensis* are variable and highly overlapping. In our opinion, leaf size is not a good characteristic. According to these points, the genus *Scutellaria* needs to be clarified in Taiwan.

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Such features, as floral morphology, pollen grains, and nutlets, are discussed. Distribution maps, descriptions and a key to the species are also given.

MATERIALS AND METHODS

Specimens examined in this study are listed with acronyms of the herbaria excluding TAI. Pollen grains prepared by the Erdtman method (1952) were studied with LM and SEM. Somatic chromosomes were studied in root tips which had been held in a solution of 0.002 M 8-hydroxyquinoline for 3-4 h at a temperature of 18-20 ℃, and then fixed in 1:3 acetic ethanol over night, hydrolysed in pectinase and squashed in acetic orcein. The voucher specimens are listed in Table 1.

RESULTS

(a). Floral morphology

Based on the length of the corolla tubes and their geniculate features three types of floral morphology are recognized in Taiwan (Fig. 1; Table 1). The robust type such as in *Scutellaria tashiroi* has a longer floral tube (2.0-2.5 cm) which is a little curved at the base. The geniculate type found in *S. indica* and *S. playfairi* has a medium length tube (1.5-2.0 cm long) which becomes abruptly vertical at the base. The curved type, in *S. barbata* and *S. taiwanensis*, has a shorter floral tube (0.9-1.5 cm) which is curved at the base but never at right angles.

(b). Pollen morphology

The pollen morphology of all Taiwan species is isopolar, tricolpate, subprolate to prolate, with rugular to reticulate tectate surface with microperforate ornamentation (Fig. 2; Table 2). The ornamentation of the grains in the genus is the same, but *Scutellaria taiwanensis* has the largest pollen grains (Fig. 3; Table 2) among the species..

(c). Nutlet morphology

It is easy to distinguish all the Taiwan *Scutellaria* species by their nutlets, especially by the ornamentation of the nutlet coat. The ornamentation of nutlet coats is composed chiefly of various arrangements of tuberculae, but the term "tuberculae" used in this paper may be interpreted differently from that of previous specialists who used light microscopes or magnifing glasses. Based on the grouping pattern of tuberculae and the shape of elevated tuberculae within the reticulae, four types of ornamentations are proposed: Type 1, grapling-hook type, has elevated tuberculae like grapling-hooks on the nutlet coat as in *Scutellaria tashiroi* (Fig. 4C; Table 2). Type 2, radiated umbrella-like

type, has elevated tubercules radiating umbrella-like as in *Scutellaria barbata* (Fig. 4F) and *S. indica* nutlets (Fig. 4I), but the hilum of the former (Fig. 4E) is shorter than that of the latter (Fig. 4H). Type 3, rounded eoneentrie type, has rounded eoneentrie tubercules as in *Scutellaria playfairi* nutlets(Fig. C). Type 4, mammillate type, has mammilae-like elevated tubercules as in nutlets of *Scutellaria taiwanensis* (Fig. 5F). The grouping pattern of tubercules in types 1 to 3 is reticulate whereas in type 4 it is non-reticulate.

(d). Chromosome

Chromosome numbers of Subgen. *Scutellaria* have been reported as $2n$ = 24-34 (Paton, 1990). In this study ,the chromosomes of all five speeies are $2n$ = 26 (Fig. 6) and extremly small.

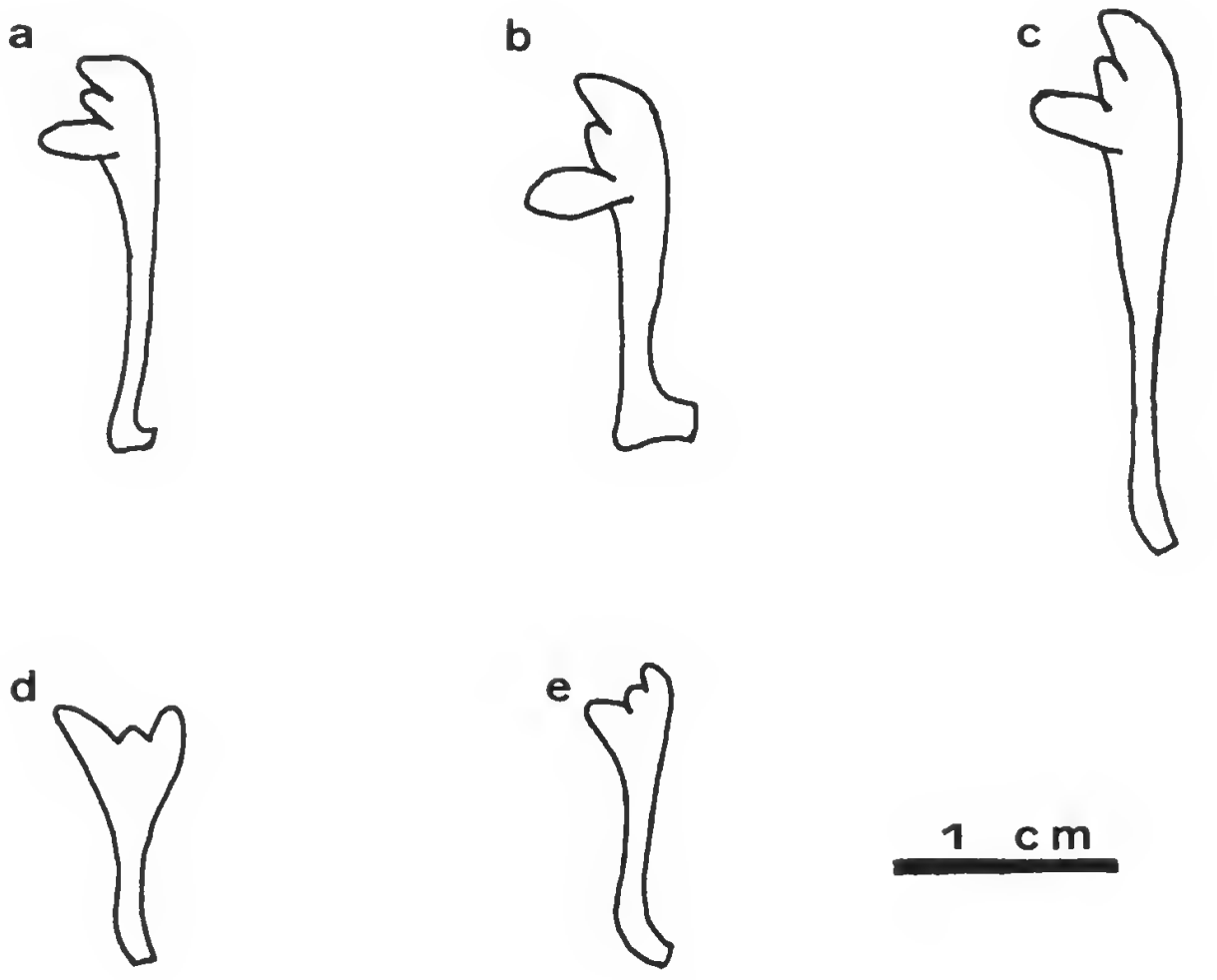

Fig. 1. Floral morphology of the speeies of *Scutellaria indica* L. (a), *S. playfairi* Kudo (b), *S. tashiroi* Hay. (e), *S. barbata* D. Don. (d), and *S. taiwanensis* C. Y. Wu (e).

Table 1. Comparison of floral morphology of *Scutellaria* in Taiwan.

Character / Taxon	Color	Size (cm)	Corolla form at base	Voucher specimen
S. barbata	purple	0.9--1.3	little curved	*Hsieh 901*
S. indica	purple, pink, or white	1.5--2.0	geniculate	*Hsieh 892*
S. playfairi	whitish purple	1.5--1.8	geniculate	*Hsieh 1146*
S. taiwanensis	white, throat with purple spot	1.0--1.5	curved	*Hsieh 1011*
S. tashiroi	dark purple	2.0--2.5	little curved	*Hsieh 1181, 1320*

Table 2. Comparison of pollen grains and seed morphology of *Scutellaria* in Taiwan.

Character / Taxon	Size of pollen (μm)	Exine pattern	Size of nutlet (mm)	Type of nutlet coat
S. barbata	20-24 x 12-16	reticulate	1.1 x 0.8	radiated umbrella-like type
S. indica	18-23 x 12-17	finely reticulate	1.3 x 1.0	radiated umbrella-like type
S. playfairi	16-20 x 10-15	loose reticulate to rugulate	1.0 x 0.8	rounded concentric tuberculae type
S. taiwanensis	23-30 x 16-20	irregular rugulate	1.4 x 1.2	mammillate type
S. tashiroi	18-22 x 14-17	loose reticulate to rugulate	0.9 x 0.8	grapling-hook type

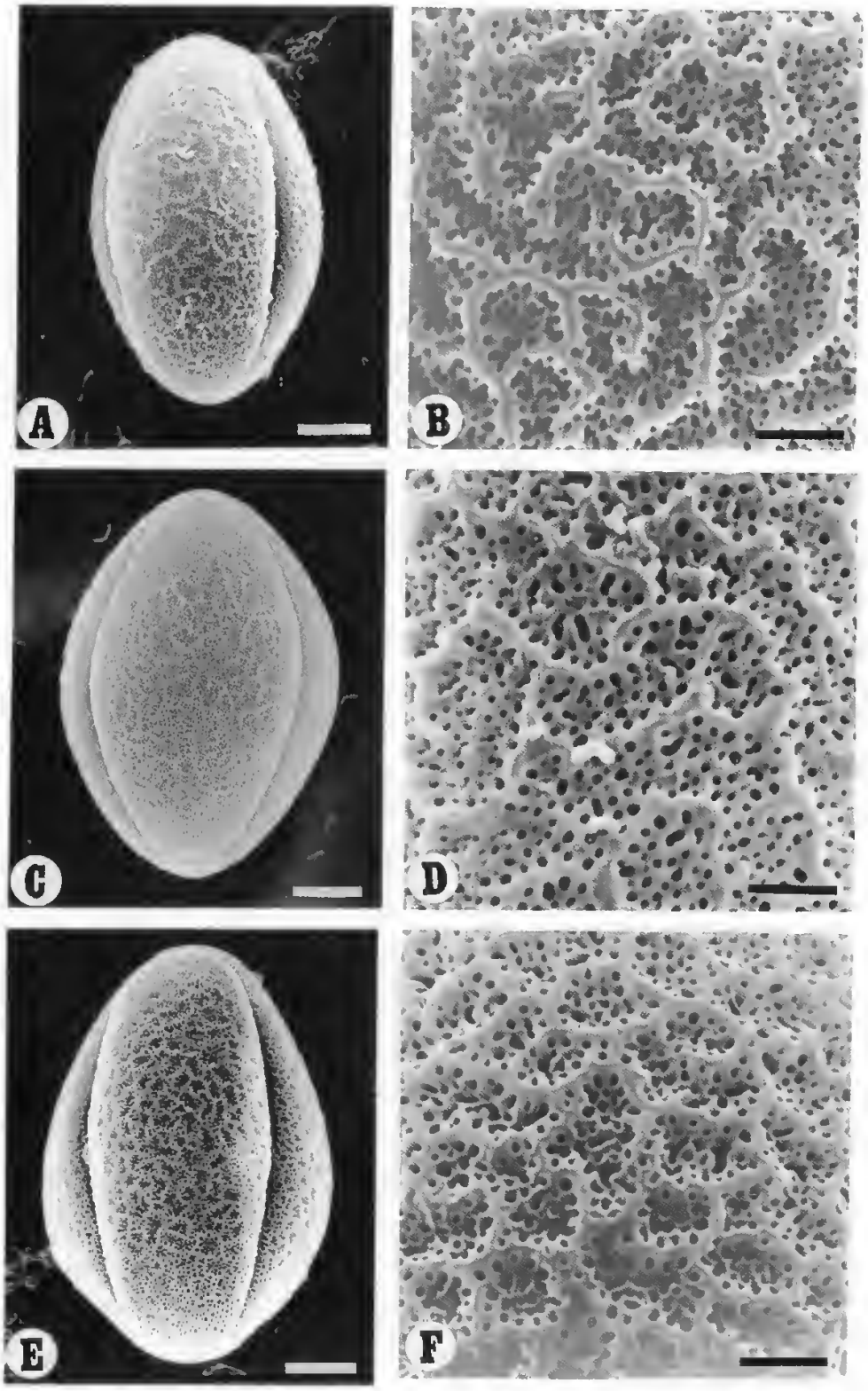

Fig. 2. SEM micrographs of pollen grains of *Scutellaria playfairi* Kudo (A, B), S. *barbata* D. Don. (C, D), and *S. indica* L. (E, F). White scale bar = 3 μ m. Black scale bar = 1 μ m.

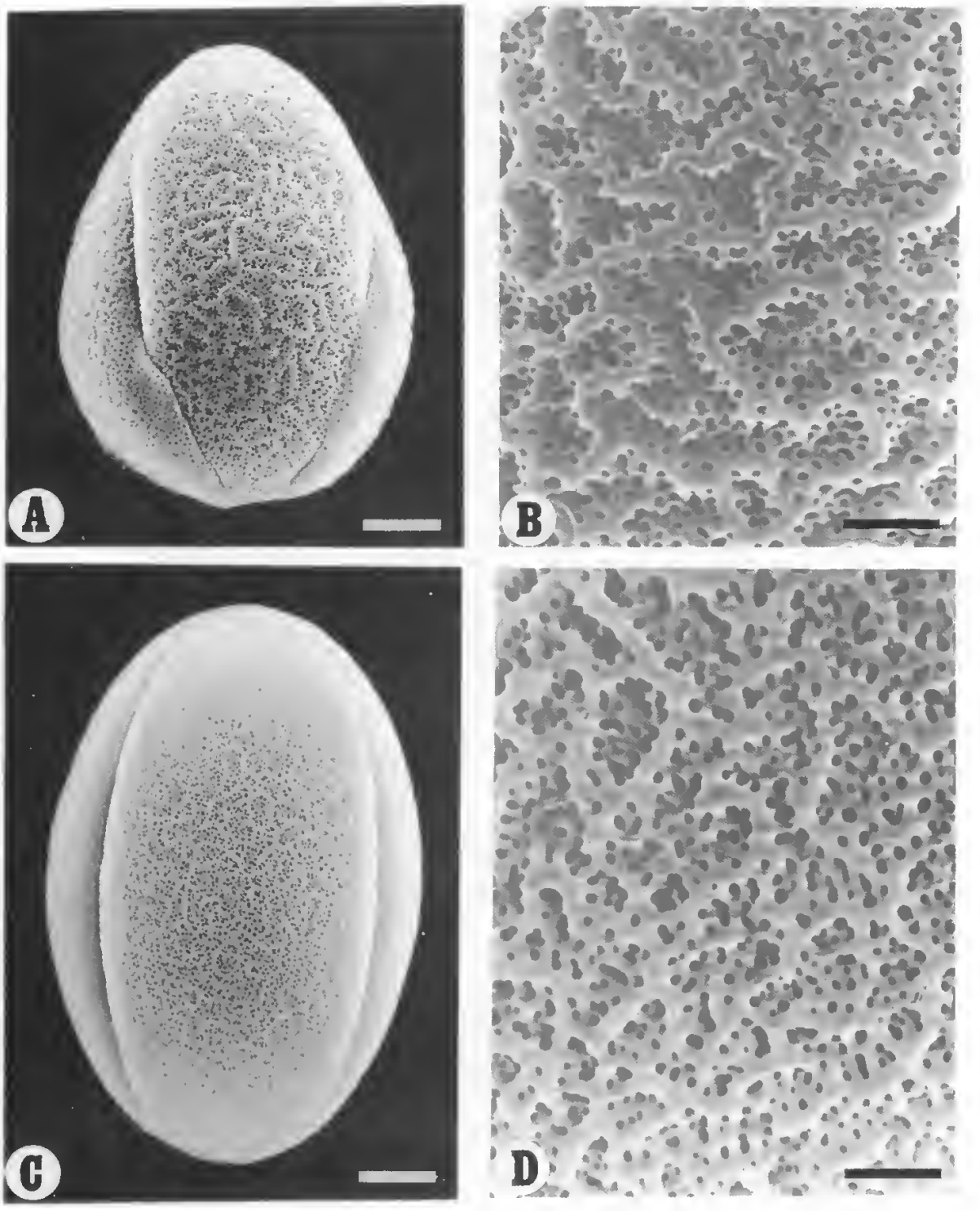

Fig. 3. SEM micrographs of pollen grains of *Scutellaria tashiroi* Hayata (A, B) and *S. taiwanensis* (C, D). White scale bar = 3 μm. Black scale bar = 1 μm.

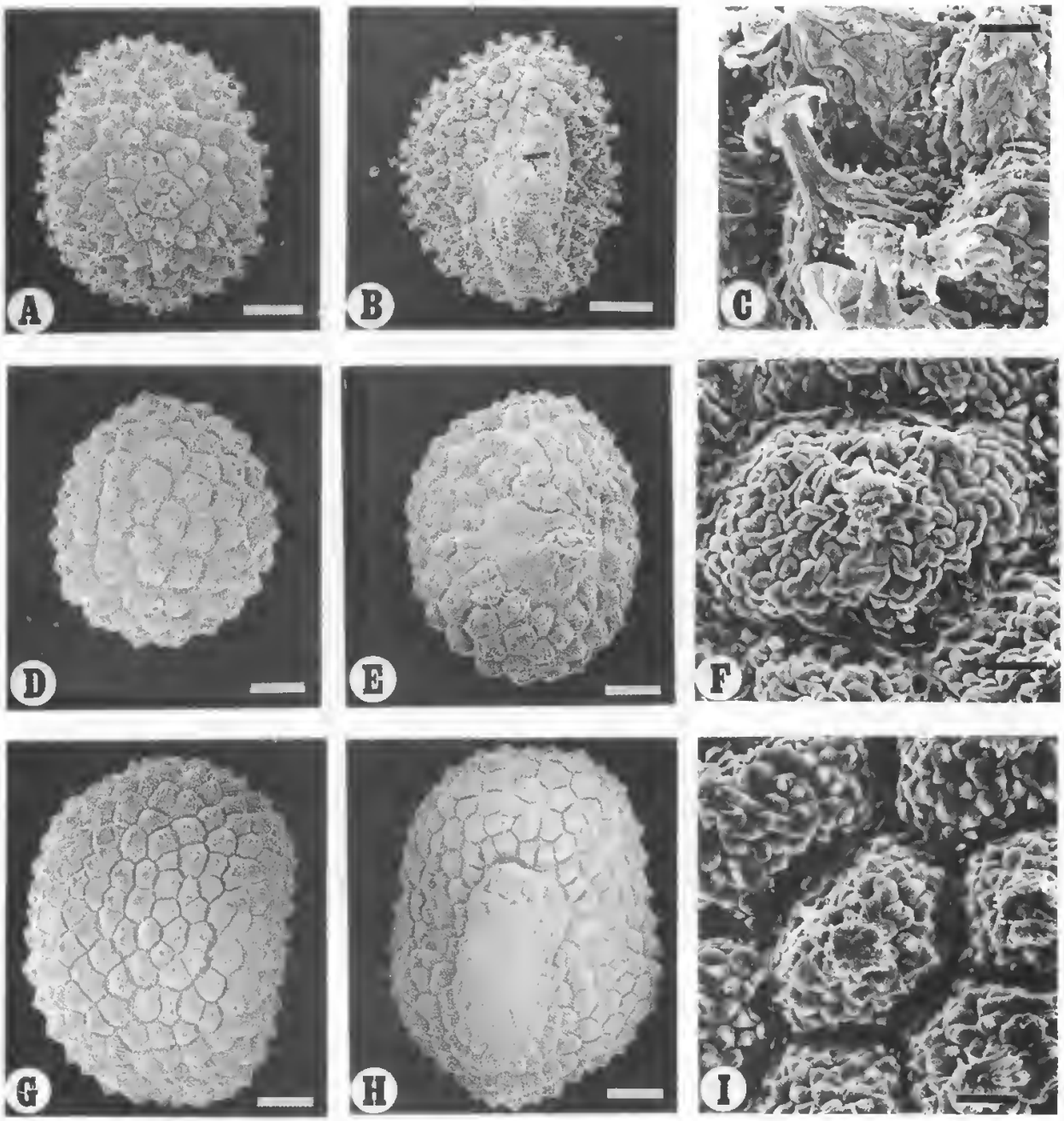

Fig. 4. SEM micrographs of seeds of *Scutellaria tashiroi* Hayata (A, B, C), *S. barbata* D. Don. (D, E, F), and *S. indica* L. (G, H, I). White scale bar = 200 μ m. Black scale bar = 30 μ m.

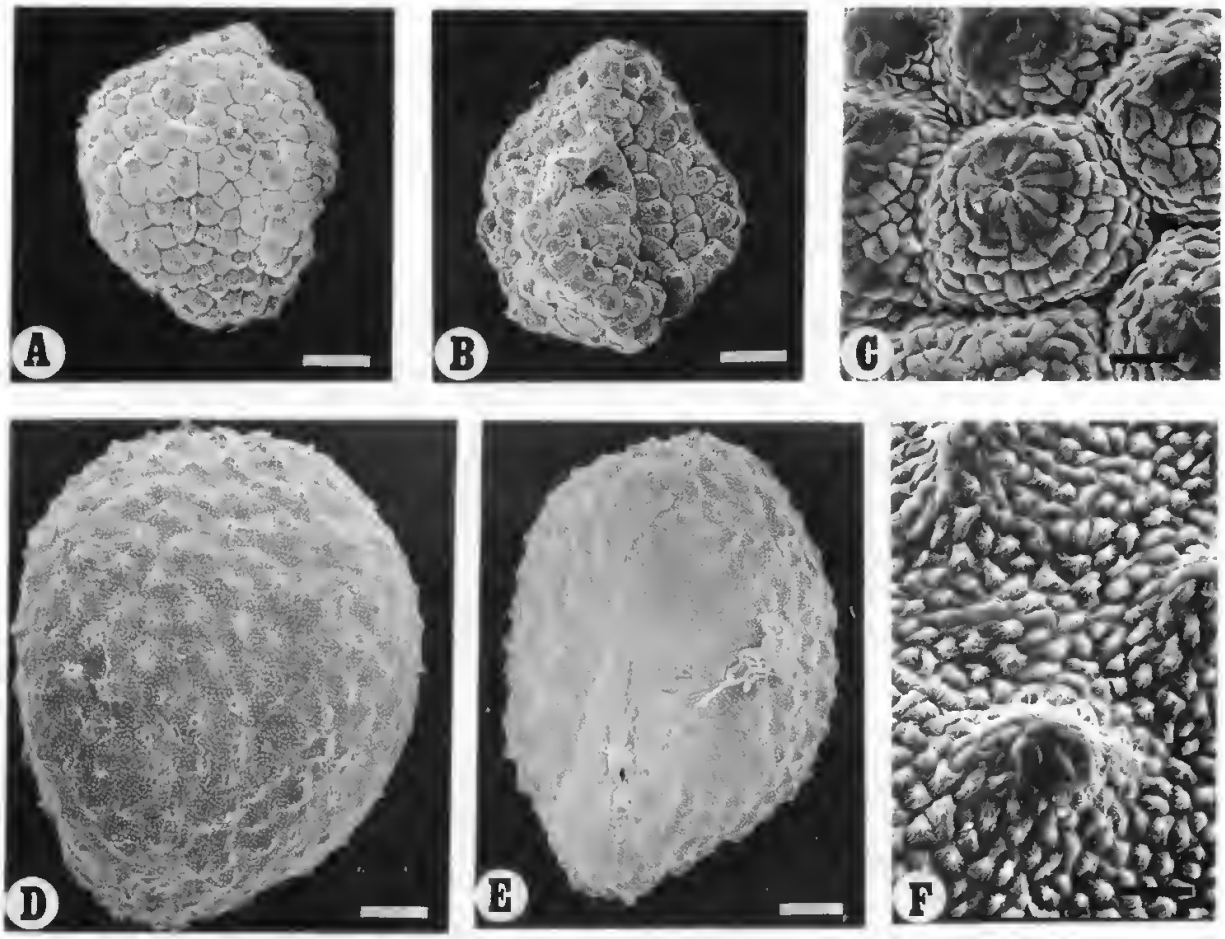

Fig. 5. SEM micrographs of seeds of *Scutellaria playfairi* Kudo (A, B, C) and *S. taiwanensis* C. Y. Wu (D, E, F). White scale bar = 200 μm. Black scale bars = 30 μm.

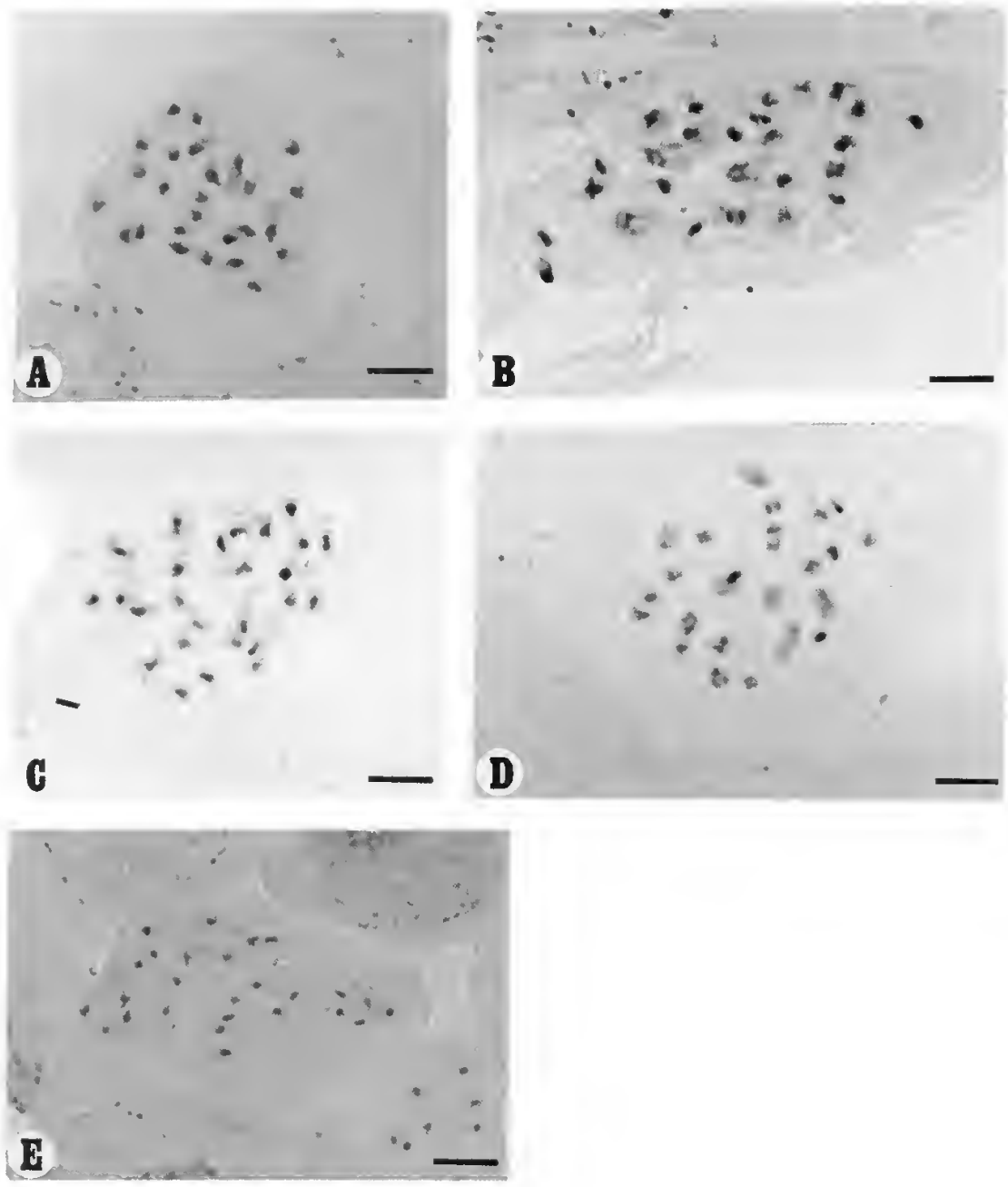

Fig. 6. Mitotic metaphase chromosome of *Scutellaria barbata* D. Don. (A), *S. indica* L. (B), *S. playfairi* Kudo (C), *S. taiwanensis* C Y. Wu (D), and *S. tashiroi* Hayata (E). Scale bar = 4 μ m.

CONCLUSION

After our studies in floral morphology and of palynological and seed morphological features, we arrived at the following taxonomic treatment. Five species in Taiwan are recognized. A key to species preceeding the description of each taxon is presented:

KEY TO THE SPECIES

1. Leaves narrowly ovate, glabrous on both surfaces..... (1) *S. barbata*
1. Leaves ovate to broadly ovate, pubescent at least on the veins of the lower surface
   2. Petioles short, about 2-5-(8) mm long
      3. Corolla tube geniculate on the anterior side at base, 1.5--1.8 cm long..... (3)*S. playfairi*
      3. Corolla tube slightly curved on the anterior side at base, 2.0-2.5 cm long..... (5) *S. tashiroi*
   2. Petioles long, about 10-20 mm long
      4. Leaves densely pubescent ; corolla tube 1.5 -2.0 cm long..... (2) *S. indica*
      4. Leaves glabrous or pubescent on the veins of the lower surface; corolla tube 1.0 -1.5 cm long..... ..... (4) *S. taiwanensis*

1. **Scutellaria barbata** D. Don, Prod. Fl. Nepal. 09. 1825; Ohwi, Act. Phytotax. Geobot. **4:** 32. 1935; Murata in Hara eds. Fl. E. Himal. 2nd Rep. 117. 1971; H. W. Li, Fl. Reip. Pop. Sinic. **65**(2): 229. *t. 49-5.* 1977; Yamazaki in Journ. Jap. Bot. **67:** 315-319. 1992. 向天盞 Fig. 7

Scutellaria rivularis Benth. in Wall., Cat. n. 214. 1829; Benth. in Wall., Pl. As. Rar. **1**: 66. 1830; Matsum. et Hayata in Journ. Coll. Sci. Univ. Tokyo **22**: 314. 1906; Kudo, Mem. Fac. Sci. Agr. Taihoku Univ. **2**: 268. 1929; Huang et Cheng, Fl. Taiwan **4**: 524. 1978.

A perennial herb, glabrous, up to 30 cm high; stems erect, squarein x-section. Leaves sessile or lower ones with petioles up to 0.5 cm long; blades narrowly ovate to ovate, 1-3 x 0.5-1 cm, the base obtuse to truncate, the apex acute to obtuse, the margins distantly serrate on the lower leaves, entire on the upper ones, glabrous , both surfaces covered with glandular dots, the veinlets 2-3 paired. Flowers axillary in leafy bracts, opposite, forming a raceme; calyx tubular, bilobed, minutely hairy; corolla pinklish-purple, tubular, 9-13 mm long, bilabiate, covered with glandular hairs, the upper lip very broadly ovate, emarginate at apex, the lower lip broadly ovate, 3-lobed, the central lobe emarginate at apex. Stamens 4, didynamous. Pollen grains 3-colpate, prolate, isopolar, 20-24 x 12-16 um, tectum reticulate with microperforae. Nutlets orbicular, 1.1 x 0.8 mm, nutlet coat with umbrella-like elevated tuberculae as ornamentation; hilum lateral.

Flowering and fruiting season from October to the following May.

This species is mainly distributed in the northern area and rarely in the southern area.

Specimens examined:

Taipei Co.: *Chou et al. 7633*, *Yamamoto s. n.* Dec 1930; Chisingshan, *Wu s. n.* May 1934; Hsiaokotou, *Tang 1362*, *Huang 214*, *Hsu s. n.* Dec 1968, *Hsieh 901*; Kankou, *Liu et Shen s. n.* Sept 1933; Keelung, *Suzuki 4486*, *Sasaki s. n.* May 1925; Mucha, *Peng 1464*; Pali, *Ho 191*; Pinlin, *Kuo 8119*; Shihting, *T. C. Huang 10372*, *Kuo 11561*; Suigenchi, *Shimizu 210*, *Suzuki s. n.* Apr 1929; Tamsui, *Hsu 4441*, *T. Y. Yang et K. C. Yang 4474*; Wantang, *Cheng 737*; Wuchishan, *Cheng 1478*; ihoton, *Kao 7621*. **Ilan Co.**: Chilan, *T.*

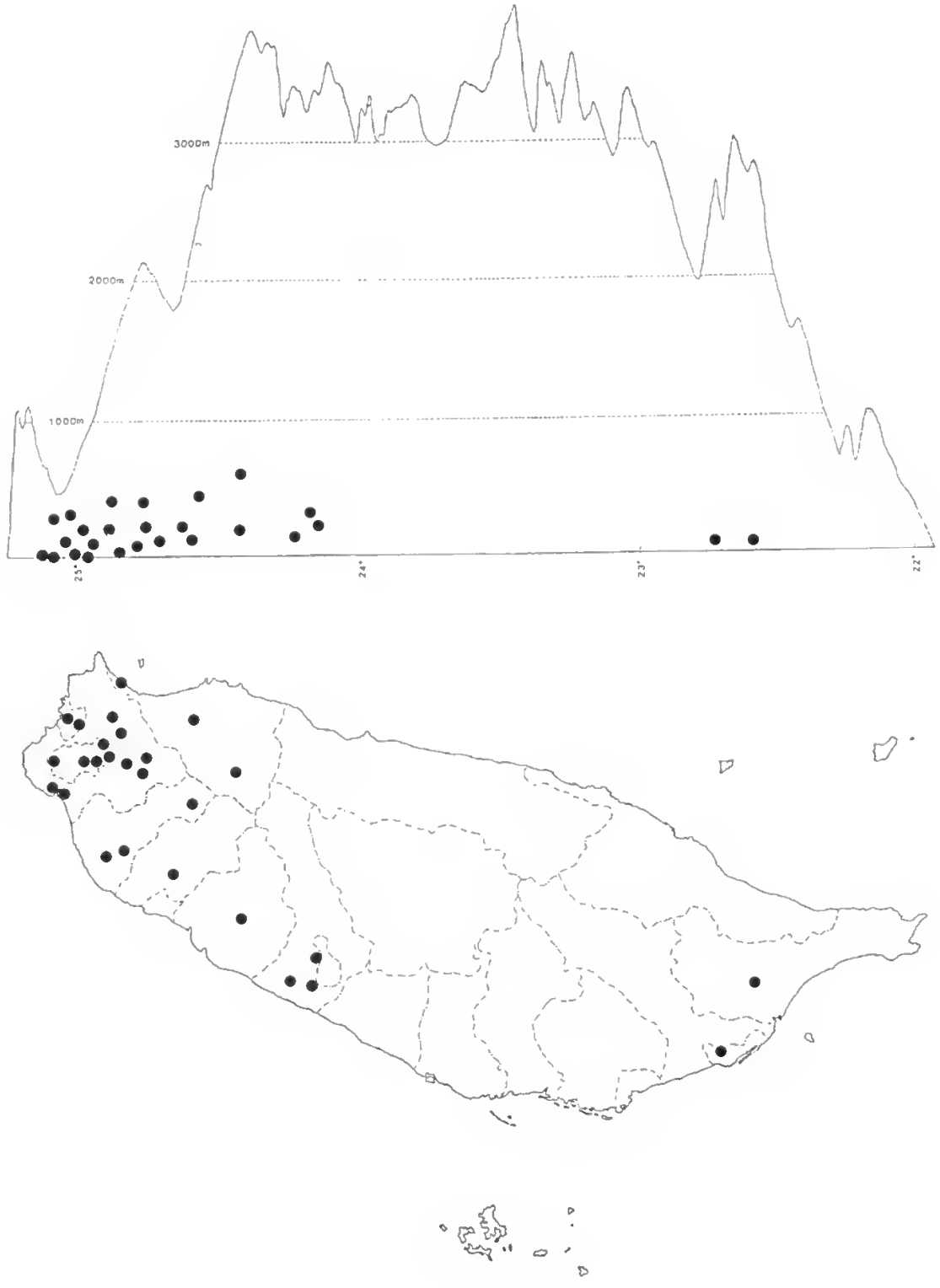

Fig. 7. Latitudinal and altitudal distribution of *Scutellaria barbata* D. Don.

C. Huang et al. 10725; Tali, *Chang 2171*; Shanshin, *Kao 9656*. **Taoyuan Co.**: Chungli, *Kuo 6613*; Jenmei, *Kuo 6197*; Palin, *Chiang s. n.* Apr 1990. **Miaoli Co.**: *T. C. Huang 5277*. **Taichung Co.**: Fongyuan, *Sasaki s. n.* Jan 1923; Pingtung, *Hsu 9128*; Tachia, *Kao 9677*. **Kaohsiung Co.**: Kaohsiung, *Playfair s. n.* May 1889 (K, Photo). **Pingtung Co.**: Pingtung, *S. Z. Yang 1041, 1042.*

2. **Scutellaria indica** L., Sp. Pl. 600. 1753; Matsum. et Hayata, Journ. Coll. Sci. Univ. Tokyo **22:** 313. 1906; Hayata, Icon. Pl. Formos. **6:** 58. 1916. et 8: 85. 1919; . W. Li, Fl. Reip. Pop. Sinic. **65**(2): 172. 1977. excl. syn. *S. tashiroi* Hayata; Huang et Cheng. Fl. Taiwan **4:** 521. 1978. 印度黃芩 Fig. 8

Scutellaria taiwanense Ying, Mem. Coll. Agr. NTU. **31**(1): 24. 1991. ***syn. nov.***
Type: Taichung Co. Derehi, *Ying s. n.* Sept 1990. (NTUF!).

A perennial herb, up to 20 cm high, covered with septate hairs; stems erect or procumbent at base, often tufted, puberulent. Leaves chartaceous, petiolate; petioles puberulent, 1-2 cm long; blades broadly ovate to cordate, 1.5-4 x 1-3.5 cm, the base obtuse to truncate, the apex obtuse, the margins crenate, puberulent, veinlets 4-5 pairs. Inflorescence a terminal raceme, up to 8 cm long; leafy bracts small, obovate. puberulent and glandular-hairy, bearing a scutellum in front; corolla purple, tubular, 1.5-2 cm long, prominently geniculate at base, bilabiate. Pollen grains 3-colpate, subprolate, isopolar, 18-23 x 12-17 um, tectum finely reticulate with microperforae. Nutlets ellipsoidal, 1.3 x 1.0 mm, nutlet coat with umbrella-like elevated tuberculae ornamentation; hilum about one third the length of the seed.

Flowering and fruiting season from September to the following May.

This species is distributed in northern and central areas below 2,400 m elevation in Taiwan.

Specimens examined:

Taipei Co.: Fulon, *Kao 10727;* Hsintien, *Shimizu 2074*; Kanko, *Cheng 480*; Keelung, *Suzuki 4711*, *Sasaki s. n.* Mar. 1930; Kueishan, *Suzuki s. n.* Feb. 1928, *Chuang3161*; Kuangingshan, *Kuo 6078*, *Chuang 2155; Mutsushan, Wang 3016, Shimitsu 505;* Neihu, *Kao 4494;* Peihsinchuang, *Ou et Kao 9278*; Pinlin, *T. C. Huang 7963*, *H. N. Yang s. n.* Nov. 1978, *Chou 10*; Shihting, *T. C. Huang 10371*; Suangchikou, *Kuo 10866*; Tatunshan, *T. C. Huang 9073*, *Suzuki 10244*; Wulai, *Kao 7170*, *Hsieh 892*, *Sasaki s. n.* Mar. 1922; Yangmingshan, *Kuo 2903, Chuang 2155*. **Ilan Co.:** Lotung, *Sasaki s. n.* Oct. 1928. **Taoyuan Co.:** Amuhyo, *Mori 266*; Palin, *Cheng 649*. **Hsinchu Co.:** Tachienshan, *H. N. Yang 1598*, Hsienchiaoshih, *Hsieh 858*. **Miaoli Co.:** Mt. Santou, *T. C. Huang 8792*; Sansa, *Shimada 1127*. **Taichung Co.:** Kukan, *T. C. Huang 10325,14549*; Kukan to Chingshan, *T. Y. Yang 1358*, *J. C. Wang 2927*; Pahsienshan, *Suzuki 5580*; Shunkuan, *T. C. Huang et C. F. Hsieh 7303*; Heuhshan, *Ying 5103*(NTUF). **Nantou Co.:** Chitou, *T.C. Huang 9*; Kuangtaochi, *C. F. Hsieh et Wu 1438*; Meyfong, *Ou et Kao 9366;* Puli, *Seki 105*; Tangpu, *S. Z. Yang 3766* (PAI); Tunguan,*Cheng 1390*. **Hualien Co.:** Taroko, *Suzuki 8894;* Tiensiang, *Hsu 492*; Yenhai logging trail, *J. C. Wang 7613*.

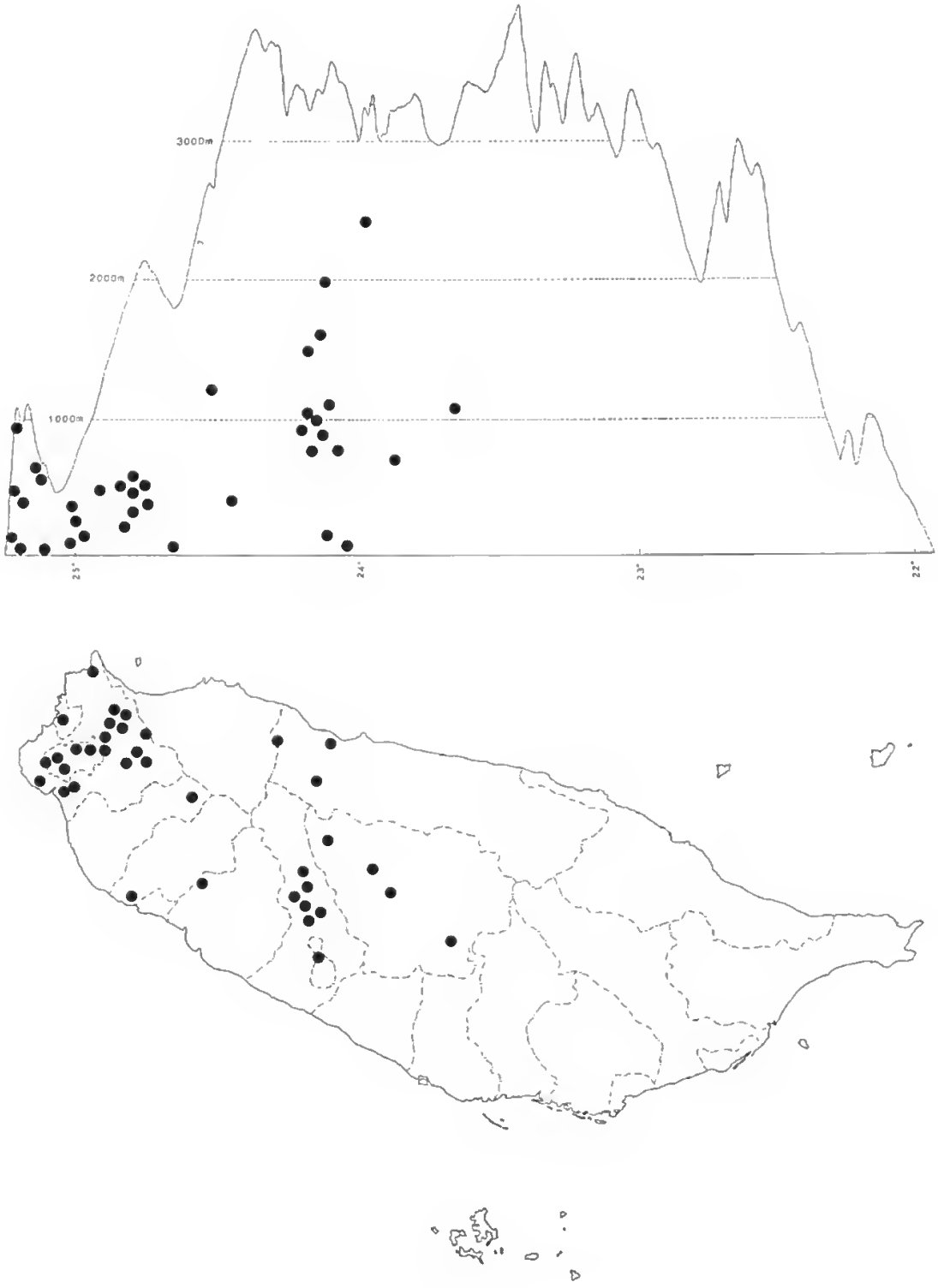

Fig. 8. Latitudinal and altitudal distribution of *Scutellaria indica* L.

3. **Scutellaria playfairi** Kudo, Mem. Fac. Sci. Agr. Taihoku Univ. **2:** 254. 1929; Yamazaki in Journ. Jap. Bot. 67: 316. 1992. p.p., excl. syn. *S. procumbens* Ohwi.
布烈氏黃芩 Fig. 9, 10.

Scutellaria luzonica auct. non Rolfe: Forb. et Hemsl. in Journ. Linn. Soc. Bot. **26**: 296. 1890; Henry, List Pl. Formos. 73. 1896; Matsum. et Hayata in Journ. Coll. Sci. Univ. Tokyo **22:** 314. 1906; Hayata in Journ. Coll. Sci. Univ. Tokyo **25:** 183. 1908; Sasaki, List Pl. Formos. 360. 1928.
Scutellaria tashiroi Hayata var. *playfairi* (Kudo) Yamazaki in Journ. Jap. Bot. **44**(6): 174. 1969. excl. syn. *S. procumbens* Ohwi.
Scutellaria luzonica Rolfe var. *playfairi* (Kudo) Yamamoto in Journ. Trop. Agr. **6**: 558. 1934.
Scutellaria playfairi auct. non Kudo: Li, Fl. Reip. Pop. Sinic. **65**(2): 146. 1977.
Scutellaria javanica Junch. var. *playfairi* (Kudo) Huang et Cheng in Fl. Taiwan **4**: 523. 1978. excl. Hualien. Co. specimens.

A perennial herb, up to 40 cm high; stems square in x-section, pubescent. Leaves coriaceous, petiolate; petioles pubescent, 2-5(-8) mm long; blades ovate, 1-1.5 x 1.5-1.8 cm, the base obtuse to round, the apex obtuse or round, the margins serrate, the upper surface glabrous, the veinlets sunken, the lower surface purplish, pubescent, glandular-dotted, the veinlets prominent beneath. Inflorescence in a terminal raceme, flowers opposite, 4-20 cm long, pedicels twisted, nearly in one plane,corolla purplish blue, tubular, 1.3 cm long, prominently geniculate at base, bilabiate. Pollen grains 3-colpate, prolate, 16-20 x 10-15 um, tectum loose reticulate to rugulate with microperforae. Nutlets orbicular, 1.0 x 0.8 mm, nutlet coat with rounded concentric elevated tuberculae ornamentation; hilum lateral.

Flowering and fruiting season from June to December.

S. playfairi and *S. tashiroi* are closely related in external morphology. They have been considered as different varities in the same species, until Yamazaki (1992) segregated them. Our results support this latter opinion.

Specimens examined:

Chiayi Co.: Fanlu, *Peng 13449* (HAST). **Tainan Co.**: Paiho, *Kuoh 3945*; Kuantzuling, *Morimoto 486*, *A. Hsieh 9*. **Kaohsiung Co.**: Chishan, *Mori s. n.* Nov. 1907; Fongshan, *Moritami s. n.* Nov. 1910; Liukuei, *Tsai 26*; Tengchih, *T. C. Huang et al. 14434*. **Pingtung Co.**: Hengchun, *T. C. Huang 13351*, *Suzuki 6133*, *4978*; Machia, *T. C. Huang et Kao 7357*; Nanjenshan, *Suzuki 5022*, *6088*, *Matsuda s. n.* Aug. 1915, Shihwen, *Hsieh 1146*; Shoka to Tsaopu, *T. C. Huang et al. 14076*; Tachienshihshan, *Peng 7142* (HAST); Lilongshan, *T. C. Huang et al. 16266*; enroute from Wutai to Haucha, *Lin 380* (HAST). **Taitung Co.**: Luychchi, *Yamamoto et Mori 12, 65*; Hsinwulu, *S. F. Huang 3200, 3698*; Tawu, *Shimizu 2789*; Tawu to Tsusucipo, *Hsu 3432*.

4. **Scutellaria taiwanensis** C. Y. Wu, Fl. Reip. Pop. Sinic. **65**(2): 177, 580. t. 40, 15-21. 1977. Type : In silvis Arayuwan, *Kudo et Mori s. n.* Apr. 1930 (Holotype PE!).
臺灣黃芩 Fig. 9, 11.

Scutellaria indica auct. non L. : Henry in List Pl. Formos. *Henry 896.*
Scutellaria lilungense Ying in Mem. Coll. Agr. NTU. **31**(1): 26-27. 1991. Type: Lilongshan, Pingtung Co.: *Ying s. n.* Nov. 18. 1990. (Holotype NTUF!). ***syn. nov.***

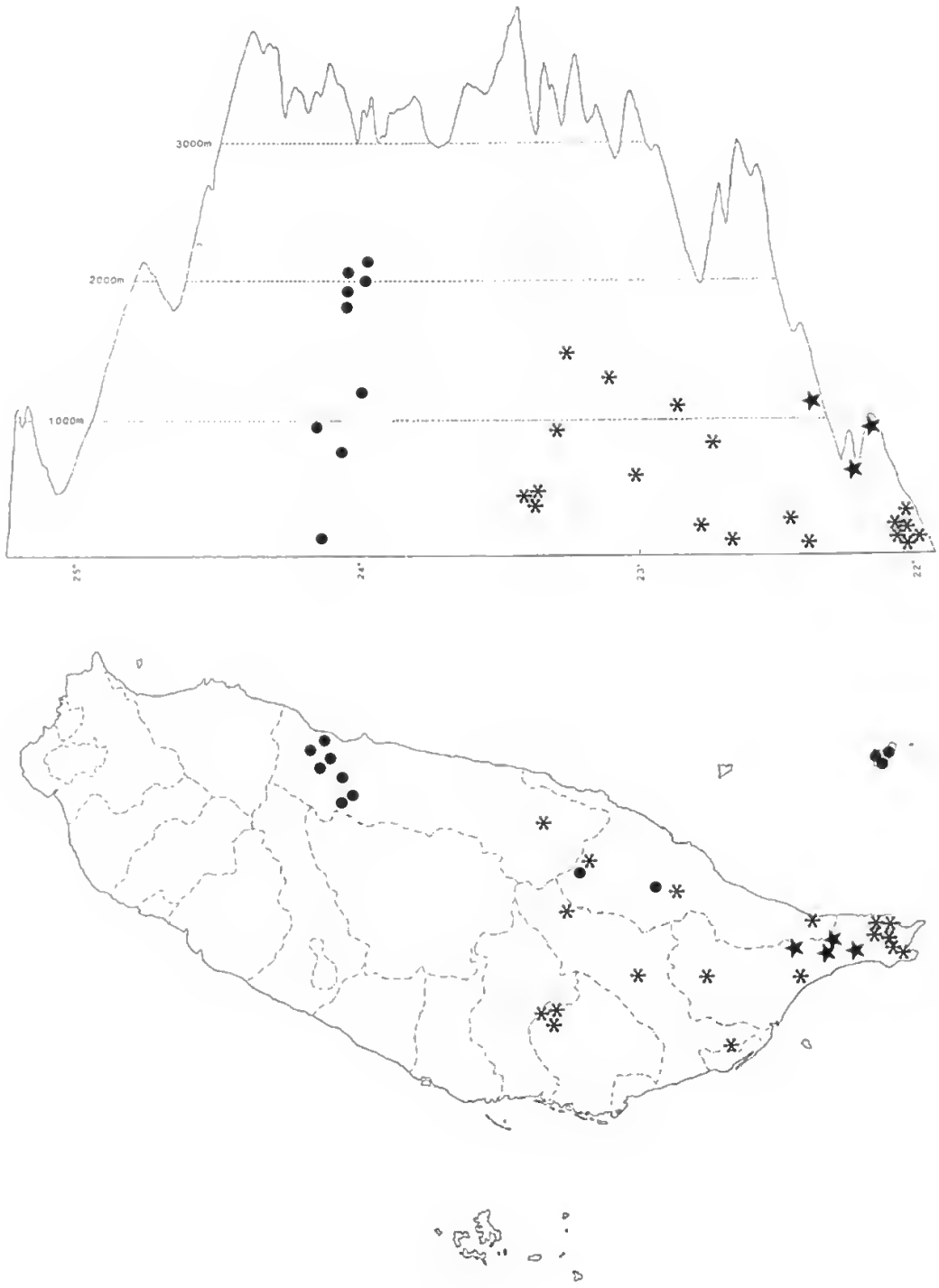

Fig. 9. Latitudinal and altitudal distribution of *Scutellaria playfairi* Kudo (∗), *S. taiwanensis* C. Y. Wu (★), and *S. tashiroi* Hayata (●).

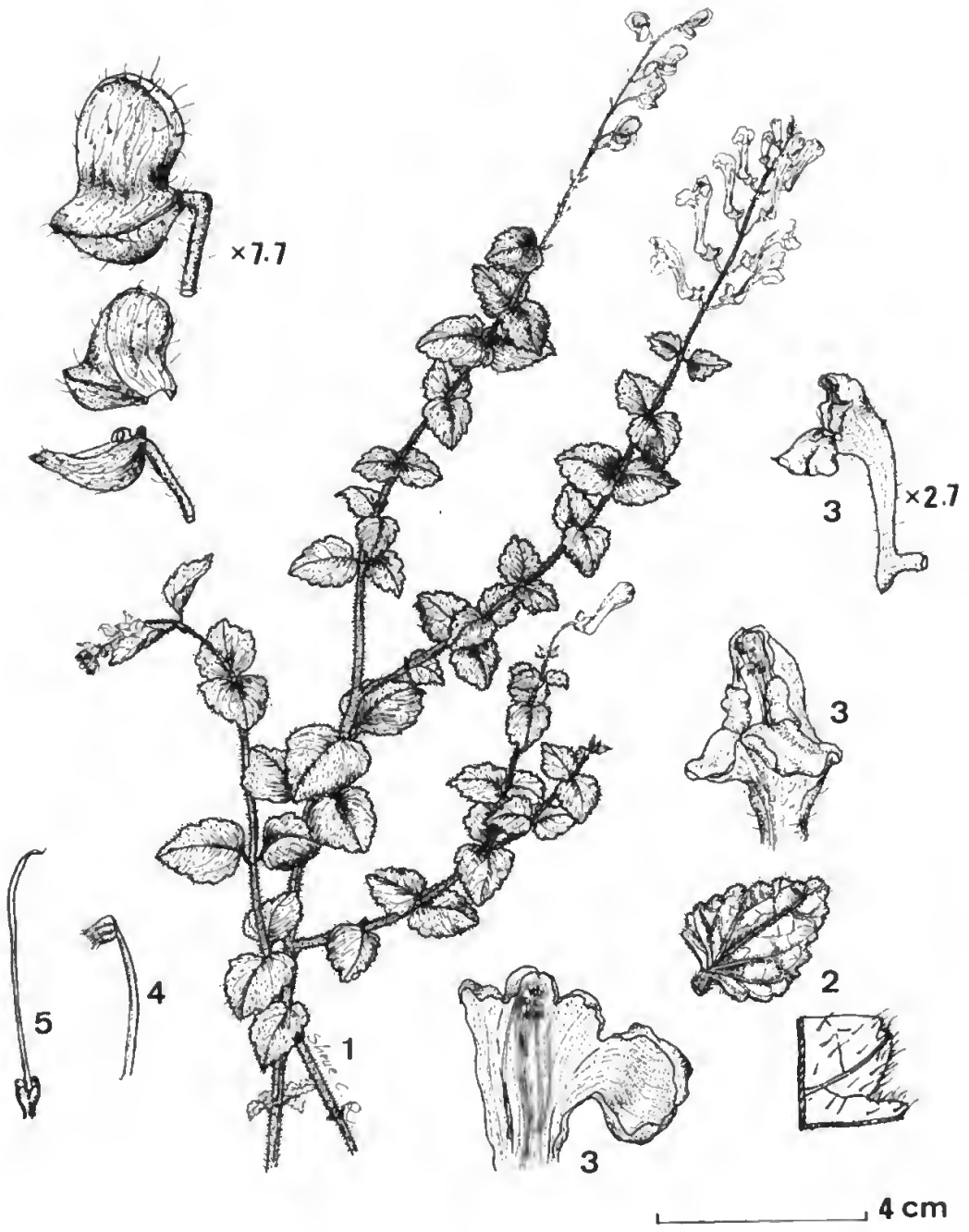

Fig. 10. Illustration of *Scutellaria playfairi* Kudo. 1. Habit; 2. Leaf; 3. Corolla; 4. Anther; 5. Pistil; 6. Fruits.

Fig. 11. Illustration of *Scutellaria taiwanensis* C. Y. Wu. 1. Habit; 2. Cross-section of stem; 3. Leaf; 4. Hairs of leaf; 5. Corolla; 6. Fruits.

A perennial herb, 10-25 cm high; stems ereet, often tufted, pubescent. Leaves chartaceous, petiolate; petiolcs pubescent, 0.5-1.5 cm long; blades ovate to rhomboid-ovate, 1.5-3.0 x 1.0-2.0 cm, the base obtuse or truncate, the apex acuminate to obtuse, the margins crenate 2-4, glabrous, the lower surfaee purple, 3-4 nerved. Flowers 4-10, opposite, forming a terminal loose raceme, 2-4 em long, bracts leafy ovate, small, entire and ciliate; corolla white with purplish spot in throat, 1-1.5 cm long, pubescent. Pollen grains 3-colpate, subprolate, isopolar, 23-30 x 16-20 um, tectum irregular rugulatc with microperforae. Nutlets orbicular, 1.4 x 1.2 mm; nutlet coat with mammilae tuberculae ornamentation.

Flowering and fruiting season from September to the following April.

The specimen identified by A. Henry (*Henry 2073*, K) as *S. indica* L. (as listed in his List of Plant Formos. n. 802.), should be correctly referred to *S. taiwanensis*. The type specimen of *S. taiwanensis* C. Y. Wu collected by *Kudo et Mori s. n.* Apr. 1930 from Arayuwan, is located in the southern part of Taiwan, but precise locality is not known now. So, this species attributed to Mt. Ali by Li (1977) is a mistake.

Specimens examined:

Pingtung Co.: Lilongshan, *Ying s. n.* Nov. 1990 (Holotypc of *S. lilungense* NTUF!), *Lu 46* (PAI), *S. Z. Yang 6621* (PAI), *Hu 910, Huang et al. 16268*; In silvis Arayuwan (southern Taiwan), *Kudo et Mori s. n.* Apr. 1930 (Holotype of *S. taiwanensis* PE!). **Taitung Co.**: Chinshuiying, *J. C. Wang et al. 7391* (TNU), *S. Z. Yang et C. G. Lin 220720* (PAI), *S. Z. Yang 25197*, *Hsieh 1011*.

5. **Scutellaria tashiroi** Hayata, Icon. Pl. Formos. **8:** 85. 1919; Yamazaki n Journ. Jap. Bot. **44**(6): 175. 1969; et **67:** 316. 1992. 田代氏黃芩 Fig. 9, 12.

Scutellaria procumbens Ohwi in Fedde Rep. Sp. Nov. **36:** 52. 1934.
Scutellaria procumbens Ohwi var. *tomentosa* Ohwi in Act. Phyt. Geobot. **4**: 33. 1935.
Scutellaria tashiroi Hatata var. *tomentosa* (Ohwi) Yamazaki in Journ. Jap. Bot. **44**(6): 175. 1969.
Scutellaria playfairi auct. non Kudo.: H. W. Li, Fl. Reip. Pop. Sinic. **65**(2): 146. 1977.
Scutellaria playfairi Kudo var. *procumbens* (Ohwi) Wu et Li. op. cit.
Scutellaria javanica Jungh. var. *luzonica* auct. non (Rolfe) Keng: Huang et Cheng in Fl. Taiwan **4**:523. 1978. p. p.
Scutellaria tashiroi Hayata var. *haianshanensis* Yamazaki in Journ. Jap. Bot. **67**: 316. 1992. ***syn. nov.***
Scutellaria tarokoensis Yamazaki, Journ. Jap. Bot. **67**: 316. 1992. ***syn. nov.***

A suffrutieose perennial herb, up to 100 em long; stems slender, procumbent, tufted, puberulent. Leaves coriaceous, petiolate; petioles puberulent, 2-5(-8) mm long; blades ovate to triangular-ovate, (0.5-)2-3.5 x (0.4-)1.5-2.5 cm long, the apex obtuse , the base narrowly cordate, the margins crenate, the upper surface glabrous, the veinlets sunken, the lower surface puberulent or glabrous, covered with glandular dots. Infloreseence in axillary or terminal raceme, 3-8 em long, flowers opposite, braets cuneate-rhomboidal. Pollen grains 3-colpate, subprolate, isopolar, 18-22 x 14-17 um, teetum loose reticulate to rugulate with microperforae. Nutlets orbieular, 0.9 x 0.8 mm, nutlet coat with grapling-hook tubereulae ornamentation; hilum lateral.

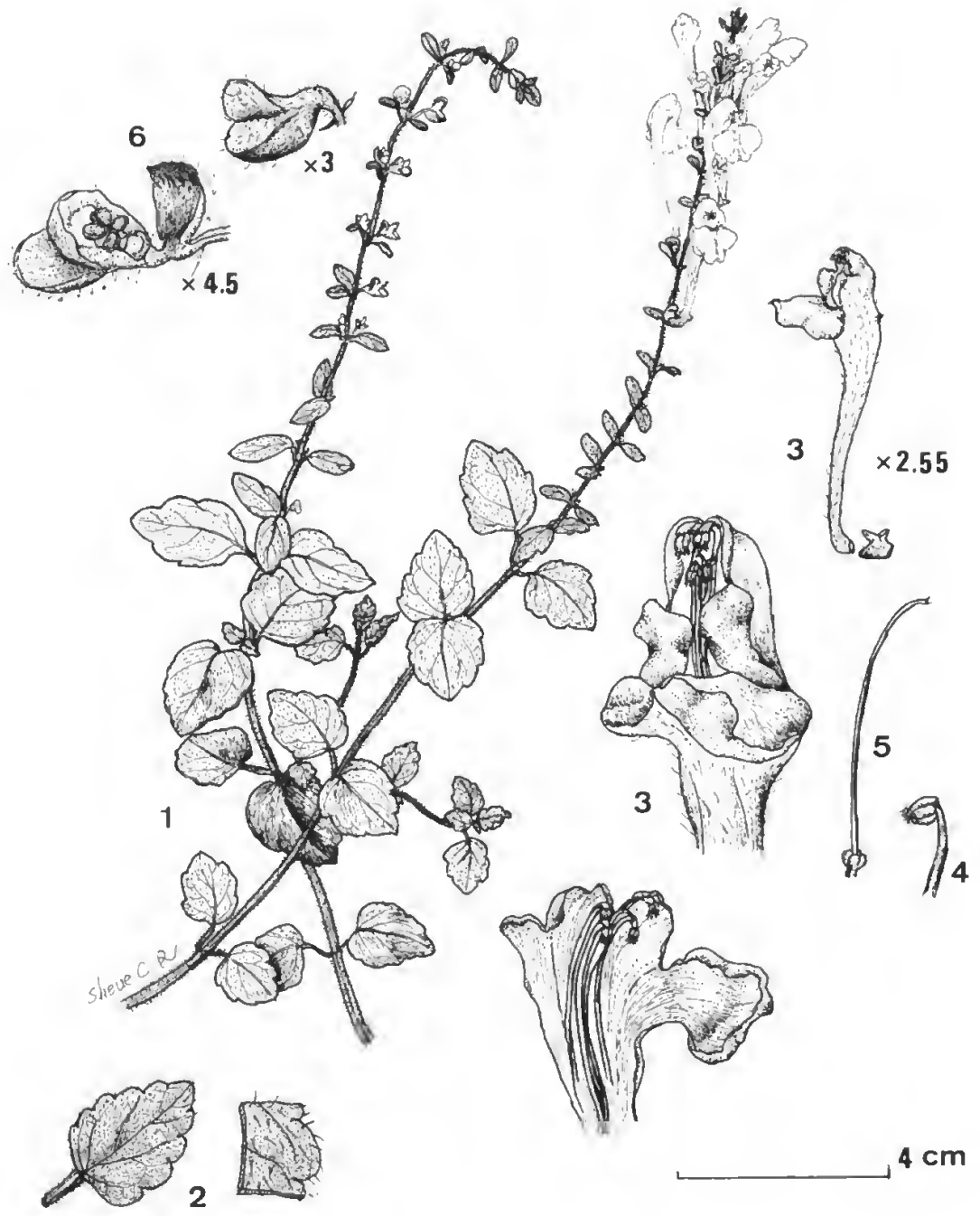

Fig. 12. Illustration of *Scutellaria tashiroi* Hayata. 1. Habit; 2. Leaf; 3. Corolla; 4. Anther; 5. Pistil; 6. Fruits.

Flowering and fruiting season from July to December.

Although there is some variation in this disjunct species, an observation of the living plants and a study of a large number of herbarium specimens indicate that the varieties are conspecific with reference to the floral morphology, pollen grains, and seed morphology.

Specimens examined:

Hualien Co.: Taroko, *Hosokawa 5113*, *Suzuki s. n.* Nov. 1932, *Suzuki et Hukuyama 16352*, *Keng et Kao 2586*; Tienhsian, *T. C. Huang 10169, Hsieh 1181*; Chilai, *Suzuki 1878*, *Sasaki s. n.* Aug. 1929. *Nakamura 4925*, *4994*; Luanshan, *T. C. Huang 4248*, *Kuo et al. 6955*, *C. Hsu 3630*; Chiencheng, *Suzuki s. n.* Aug. 1932; Takimi, *Suzuki 1508*; Yushan, *Sasaki s. n.* Aug. 1935(without further locality).**Taitung Co.:** Luyehchi, *Yamamoto et Mori 285*; Kwanshan, *S. Z. Yang 30372, 30323*; **Orchid Island:** *T. C. Huang et Kao 5370, 5439*, *C. F. Hsieh 1614*; Hungtou to Tientzu, *Chang 2272*; Mt. Sentaku, *Sata 1677*, *1678*, *1679*; Tasenshan, *Hosokawa s. n.* July 1935; Tienchu, *Hsieh 1320.*

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臺灣植物誌之觀察(20)--臺灣產黃芩屬植物(唇形花科)[1]

謝宗欣[2]、黃增泉[2,3]

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摘　　要

本文使用外部形態、花粉、小堅果和地理分布等特徵，來探討本省產黃芩屬植物。結果可分爲5 種，即向天盞、印度黃芩、布烈氏黃芩、臺灣黃芩和田代氏黃芩等。並指出小堅果的表皮微細構造爲分種的良好特徵。本文並報導省產 5 種染色體數目皆爲 2n = 26。

關鍵字: 黃芩屬，唇形花科，分類訂正，臺灣。

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